**Amendments to the Claiims:**

This listing of claims dated April 22, 2004 will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1(amended once). A method of demodulating a multilevel signal comprising the steps of:

(a) assigning [a] values to [a] bits representing ~~said~~ a multilevel demodulated signal;

([a]b) identifying at least two ~~one~~ signal constellation vectors proximate to said multilevel signal if said bits occupy bit positions corresponding to a pair of bit positions of said at least two constellation vectors occupied by bits of non-varying values; and

([b]c) determining a reliability measure for at least one other said bit of said demodulated signal if said at least one other said bit occupies a bit position corresponding to a bit position of said at least two ~~one proximate~~ constellation vectors occupied by a bit of varying value, wherein said reliability measure is based upon a measure of the center of gravity of said two signal constellation vectors.

2(amended once). The method of claim 1 wherein the step of identifying at least one signal constellation vector proximate to said multilevel signal comprises the steps of:

(a) determining a first and a second phase component of said multilevel signal;

(b) identifying a constellation vector having a first and a second phase component of maximized absolute value but not exceeding an absolute value of said first and said second phase components of said multilevel signal;

(c) identifying any constellation vector having one phase component of maximized absolute value but not exceeding said absolute value of a ~~said~~ corresponding phase component of said multilevel signal and another phase component of minimized absolute value but not less than said corresponding phase component of said multilevel signal; and

(d) identifying any constellation vector having said first and said second phase components of minimized absolute value but not less than said corresponding phase component of said multilevel signal.

3 (amended once). The method of claim 2 further comprising the step of identifying a center of gravity equal distant from said ~~proximate~~ constellation vectors and having first and second center of gravity phase coordinates.

4 (original). The method of claim 3 wherein said reliability measure is a function of a difference between at least one of said first and said second phase components of said multilevel signal and said center of gravity phase coordinates.

5 (amended once). A method of demodulating a multilevel signal comprising the steps of:

(a) identifying a neighborhood of a signal constellation in proximity to said multilevel signal, said neighborhood defined by a set of at least one constellation signal;

(b) assigning a hard decision value to a bit of said demodulated signal if said demodulated signal bit occupies a bit position corresponding to a position of a bit having a constant value for all constellation signals of said set defining said neighborhood;

(c) determining a measure of a center of gravity of said neighborhood; and

(d) assigning a value and a reliability measure to a demodulated signal bit if said demodulated signal bit occupies a bit position corresponding to a position of a bit having a variable value for constellation signals of said set defining said neighborhood.

6 (original). The method of claim 5 wherein said reliability measure is a function of a relative position of said multilevel signal and said center of gravity of said neighborhood.

7 (original). The method of claim 5 wherein said reliability measure is a distance between said multilevel signal and said center of gravity of said neighborhood.

8 (original). The method of claim 5 wherein said reliability measure comprises a difference between a quadrature component of said multilevel signal and a quadrature component of said neighborhood center of gravity.

9 (original). The method of claim 5 wherein said reliability measure comprises a difference between an in-phase component of said multilevel signal and an in-phase component of said neighborhood center of gravity.

10 (amended once). A method of demodulating a signal comprising:

(a) acquiring a multi-level modulated signal;

(b) locating said acquired multileveled signal relative to a constellation of signal vectors; said signal vectors represented by a plurality of bits;

(c) identifying a plurality of said signal vectors defining a neighborhood of said constellation nearest said acquired signal;

(d) determining a measure of a center of gravity of said neighborhood;

(e) assigning a value to a bit representing said acquired multileveled signal if a corresponding bit is constant for said plurality of neighborhood defining vectors; and

(f) assigning a value and a measure of reliability of said value to a bit of said acquired multileveled signal if a corresponding bit varies for said plurality of neighborhood defining vectors.

11(amended once). The method of claim 10 further comprising assigning a value to a bit representing said acquired multileveled signal if said neighborhood is defined by a single signal vector.

12 (amended once). The method of claim 10 wherein said reliability measure is a function of a relative position of said acquired multileveled signal and said center of gravity of said neighborhood.

13 (amended once). The method of claim 10 wherein said reliability measure is a distance between said acquired multileveled signal and said center of gravity of said neighborhood.

14(amended once). The method of claim 10 wherein said reliability measure comprises a difference between a quadrature component of said acquired multileveled signal and a quadrature component of said neighborhood center of gravity.

15(amended once). The method of claim 10 wherein said reliability measure comprises a difference between an in-phase component of said acquired multileveled signal and an in-phase component of said neighborhood center of gravity.

16 (original). The method of claim 10 wherein said constellation of signal vectors is ordered according to a Gray code.

17(amended once). A method of demodulating a multi-level signal comprising:

(a) identifying at least one signal constellation vector proximate to said multilevel signal;

([a]b) comparing a reliability of at least two bits of said constellation vector of said demodulated multilevel signal;

([b]c) assigning a hard decision value to a bit associated with a greater reliability; and

([c]d) assigning a soft decision value to a bit associated with a lesser reliability.

18 (original). The method of claim 17 wherein said reliability is measured by a log likelihood ratio.

19 (original). The method of claim 17 wherein the step of assigning a soft decision value to said bits associated with a lesser reliability comprises the steps of:

(a) assigning a value to said bit; and

(b) assigning a measure of reliability to said bit.

20 (original). The method of claim 19 wherein said measure of reliability is a log likelihood ratio

21 (original). The method of claim 17 further comprising the steps of:

(a) limiting said measure of reliability to a predetermined range; and

(b) providing a soft decision value to bits of said demodulated multilevel signal associated a measure of reliability having values not exceeding a limiting value of said range.

22 (original). The method of claim 21 wherein said limiting value of said range equals a function of a number of bits demodulated with a soft decision.

23(amended once). A method of demodulating a multi-level signal comprising:

(a) identifying at least one signal constellation vector proximate to said multilevel signal;

([a]b) limiting a measure of reliability of said constellation vector to a predetermined range; and

([b]c) providing a soft decision value to bits of said demodulated multilevel signal associated a measure of reliability having values not exceeding a limiting value of said range.

24 (original). The method of claim 23 wherein said measure of reliability is a log likelihood ratio

25 (original). The method of claim 23 wherein said limiting value of said range equals a number of bits demodulated with a soft decision.